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"Ruthless robber! prowl no more,
Sheathe thy poignard's fervid blade
Reeking still with guiltless gore,
Shroud thee in the forest's shade.

"Wakeful bird erect thy crest,
Plume thy wing, and wind thy horn,
To the slumbering sons of rest,
Tell the tidings of the morn."

Thus the balmy breath of dawn
Warns the world of coming light,
Now the dale and dewy lawn
Disclaim the sombre sway of night.

Mark the horizon's vivid verge,
Crimson glows the rising ray;
Mark the mighty orb emerge,
The majesty of perfect day.

The feather'd minstrels of the grove,
Strain once more the tuneful throat,
Modulate the lay of love,
And sweetly swell the early note.

High soars the lark, the theme of song
With all who deck the muse's shrine:
How few, sweet bird, of all the throng,
Have warbled melody like thine!

The pilgrim from his couch of care,
Starts at the first grey glimpse of day,
Prefers to heaven a silent pray'r,
And slow resumes his weary way.

Again the rustic toils commence,
That mark the farm-yard's busy scene;
The flocks forsake the encircling fence,
And careless crop the pasture green.

The herd with lowing voice upbraid
The milk-maid loit'ring with her pail;
Perchance some shepherd met the maid,
And stays her with a tender tale.

The peasant seeks the upland field,
And know, ye palsied sons of wealth,
The plough he guides has power to yield
Serene content, and hardy health.

Expanding flow'rets now display
Fragrant scent and vivid hue,
Imbibe the calorific ray,
And drink the genial draught of dew.

Already has the Convent bell
Stopp'd its matin, sullen tone;
Now the choir's symphonious swell
Elevates the enraptur'd soul:

Now the soft seraphic song
Trembles towards it solemn close;
'Tis pity superstition's tongue
Can whisper woe in strains like those.

Hark! across the boundless heath,
The horn's full tone invades the air;
Alas! I fear it dooms to death
Some timid stag or piteous hare.

The muse has wept with many a tear,
The harmless trembler of the wood;
Oh! generous youth, the fame forbear
That's tinged with unresisting blood.

Altho' the lamp of studious youth
Sheds on his toil its midnight blaze,
Betimes he springs in quest of truth,
To trace the scientific maze.

But see! across the woodland glade,
His morning step is wont to stray;
Reclined beneath the leafy shade,
Perchance he weaves the simple lay.

Perchance, fair morn, he sing thy charms,
And dwells upon the lovely theme;
For me, while youth my pencil warms,
I'll gladly paint thy orient beam.

When closing life invokes the muse,
To cheer the gloom of hoary age,
Thy charms, fair morn, I'll re-peruse,
In nature's vast, and various page.

And when thy soft and ruddy cheek,
I learn to view with silent scorn,
Oh! may my fancy soar to seek,
In other spheres another morn.

DISCOVERIES AND IMPROVEMENTS IN ARTS, MANUFACTURES, AND AGRICULTURE.

Extracts from an essay, No. 18, on the excellent qualities of Coffee, and the art of making it in the highest perfection. By Benjamin Count of Rumford, F.R.S.

THE use of science is to explain the operations which take place in the practice of the arts, and to discover the means of improving them; and there is no process, however simple it may appear to be, that does not afford an ample field for curious and interesting investigation.

As those domestic arts, and elegant refinements, which the progress of industry, and the increase of wealth and knowledge introduce in society, contribute to the comfort and happiness of great numbers of respectable individuals; their improvement must be interesting to all those who take pleasure in contemplating the prosperity of mankind, and in contributing to their innocent enjoyments.

Among the numerous luxuries of the table, unknown to our forefathers, which have been imported into Europe in modern times, Coffee may be considered as one of the most valuable.

Its taste is very agreeable, and its flavour uncommonly so; but its principal excellence depends on its salubrity, and on its exhilarating quality.

It excites cheerfulness, without intoxication; and the pleasing flow of spirits which it occasions, lasts many hours, and is never followed by sadness, languor, or debility.

It diffuses over the whole frame, a glow of health, and a sense of ease and well-being, which is exceedingly delightful. Existence is felt to be a positive enjoyment, and the mental powers are awakened, and rendered uncommonly active.

It has been facetiously observed, that there is more wit in Europe since the use of Coffee has become general among us; and I do not hesitate to confess, that I am seriously of that opinion.

Some of the ablest, most brilliant, and most indefatigable men I have been acquainted with, have been remarkable for their fondness for Coffee; and I am so persuaded of its powerful effects in clearing up the mind, and invigorating its faculties, that on very interesting occasions, I have several times taken an additional dose of it for that very purpose.

That Coffee has greatly contributed to our innocent enjoyments, cannot be doubted; and experience has abundantly proved, that so far from being unwholesome, it is really very salubrious.

This delicious beverage has so often been celebrated, both in prose and verse, that it does not stand in need of my praises to recommend it; I shall therefore confine myself to the humble office of shewing how it can be prepared in the greatest perfection.

There is no culinary process that is liable to so much uncertainty in its results, as the making of Coffee; and there is certainly none in which any small variation in the mode of operation, produces more sensible effects.

With the same materials, and even when used in the same proportions, this liquor is one day good, and the next bad; and nobody perhaps can even guess at the cause of this difference; and what renders these variations of greater importance, is this remarkable circumstance, that when Coffee is bad, when it has lost its peculiar aromatic flavour, which renders it so very agreeable to the organs of taste and smell, it has lost its exhilarating qualities, and with them, all that was valuable in it.

Different methods have been employed in making Coffee; but the preparation of the grain is nearly the same in all of them. It is first roasted in an iron pan, or in a hollow cylinder, made of sheet-iron, over a brisk fire; and when, from the colour of the grain, and the peculiar fragrance which it acquires in this process, it is judged to be sufficiently roasted, it is taken from the fire, and suffered to cool. When cold it is pounded in a mortar; or ground in a hand-mill to a coarse powder, and preserved for use.

Great care must be taken in roasting Coffee, not to roast it too much; as soon as it has acquired a deep cinnamon colour, it should be taken from the fire and cooled; otherwise much of its aromatic flavour will be dissipated, and its taste will become disagreeably bitter.

In some parts of Italy, Coffee is roasted in a thin Florence flask, slightly closed by means of a loose cork. This is held over a clear fire of burning coals, and continually agitated. As no visible vapour ever makes its appearance within the flask, the colour of the Coffee may be distinctly seen through the glass, and the proper moment seized for removing the Coffee from the fire.

I have endeavoured to improve this Italian method, by using a thin globular glass vessel, with a long narrow cylindrical neck.* This globular vessel is six inches in diameter, and its cylindrical neck is one inch in diameter and eighteen inches long.

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* Coffee may be equally well roasted on the upper shelf of the roaster of Slater's patent Steam-kitchen; but care is requisite to turn the Coffee frequently, lest it should not be equally roasted. B.M.M.

It is laid down horizontally, and supported in such manner on a wooden stand, as to be easily turned round its axis. The globular vessel projects beyond the stand, and is placed, at a proper height, immediately over a chaffing dish of live coals. When this globular vessel is blown sufficiently thin; and when care is taken to keep it constantly turning round, when it is over the fire, there is not the smallest danger of its being injured by the heat, however near it may be to the burning coals.

The end of the cylindrical neck of the globular vessel should be closed by a fit cork, having a small slit in one side of it, to permit the escape of the vapour out of the vessel. This cork should project about an inch beyond the extremity of the neck of the vessel, in order that it may be used as a handle in turning the vessel round its axis, towards the end of the process, when the neck of the vessel becomes very hot. The progress of the operation, and the moment most proper to put an end to it, may be judged, and determined with great certainty; not only by the changes which take place in the colour of the grain; but also by the peculiar fragrance which will first begin to be diffused by it, when it is nearly roasted enough.

This fragrance is certainly owing to the escape of a volatile, aromatic substance, which did not originally exist, as such, in the grain; but which is formed in the process of roasting it.

If the Coffee in powder is not well defended from the air, it soon loses its flavour, and becomes of little value; and the liquor is never in so high perfection, as when the Coffee is made immediately after the grain has been roasted.

As the roasting and grinding of Coffee takes up some considerable time, and cannot always be done without inconvenience at the moment when the Coffee is wanted; I contrived a box for keeping the ground Coffee, which I have found, by several years' experience, to preserve the Coffee much better than any of the vessels commonly used for that purpose. It is a cylindrical box made of strong tin, four inches and a quarter in diameter, and five inches in height, formed as accurately as possible within, to which a piston is so adapted, as to close it very exactly; and when pressed down into it, to remain in the place where it is left, without being in danger of being pushed upwards by the elasticity of the ground Coffee, which it is destined to confine.

This piston is composed of a circular plate of very stout tin, which is soldered to the lower part of an elastic hoop of tin, about two inches wide, which is made to fit into the cylindrical box as exactly as possible; and so as not to be moved up and down in it, without employing a considerable force. This hoop is rendered elastic, by means of a number of vertical slits made in the sides of it.

On the upper side of the circular plate of tin, which closes this hoop below, and in the centre of it, there is fixed a strong ring, of about one inch in diameter, which serves instead of a piston rod, or a handle for the piston. The cylindrical box is closed above by a cover, which is fitted to it with care, in order that the air, which is shut up within the box (between the piston and the cover) might be well confined.

Before I proceed to describe the apparatus I shall recommend for making Coffee, it will be useful to inquire what the causes are, which render the preparation of that liquor so precarious; and in order to facilitate that investigation, we must see what the circumstances are, on which the qualities depend, which are most esteemed in Coffee.

Boiling hot water extracts from Coffee, which has been properly roasted and ground, an aromatic substance, of an exquisite flavour, together with a considerable quantity of astringent matter, of a bitter, but very agreeable taste; but this aromatic substance, which is supposed to be an oil, is extremely volatile; and is so feebly united to the water, that it escapes from it into the air with great facility.

If a cup of the very best Coffee, prepared in the highest perfection, and boiling hot, be placed on a table, in the middle of a large room, and suffered to cool, it will in cooling fill the room with its fragrance; but the Coffee, after having become cold, will be found to have lost a great deal of its flavour.

If it be again heated, its taste and flavour will be still farther impaired; and after it has been heated and cooled two or three times, it will be found to be quite vapid and disgusting.

The fragrance diffused through the air is a sure indication that the Coffee has lost some of its most volatile parts; and as that liquor is found to have lost its peculiar flavour, and also its exhilarating quality, there can be no doubt but that both these depend on the preservation of those volatile particles which escape into the air with such facility.

If the liquid were perfectly at rest, the volatile particles disseminated in it, could not escape; or at least not with the same facility as when it is agitated. Those at the surface of the liquid might fly off, but those below the surface would be confined and preserved.

Now all liquids, that are either heated or cooled, are necessarily disturbed and agitated; and the internal motions into which their particles are thrown, do not cease, till the heating or cooling process has ceased.

As the particles of fluids are much too small to be visible, the motions which take place among them cannot be seen; but means have nevertheless been found to render these motions quite evident.

If a small quantity of any solid substance in the form of a coarse powder, and having the same specific gravity as any transparent liquid, be mixed with it, and the liquid be either heated or cooled, the currents formed in the liquid in consequence of the change of its temperature, will carry along with them the visible particles of the powder, disseminated in the liquid, and the directions and velocities of those currents will become apparent.

The cause of these motions among the particles of liquids, that are heated or cooled, is perfectly known.

When a hot liquid is cooled, those of its particles which are the first exposed to the cooling influence, on losing a part of their heat, become specifically heavier than they were before; consequently they become specifically heavier than the surrounding hotter particles, which causes them to descend towards the bottom of the containing vessel.

This descent of the particles which are cooled necessarily puts the whole mass of the liquid in motion. The warmer and lighter particles are continually rising towards the surface of the liquid; while the colder and heavier particles are descending; and these motions never can cease, till the whole of the liquid has acquired the precise temperature of the surrounding atmosphere.

When the liquid is heated, similar motions take place; but in an opposite direction. The particles first heated, being rendered specifically lighter by this augmentation of temperature, rise upwards; and give place to the colder and heavier particles which descend.

These motions may be rendered visible by a very simple contrivance.

If one ounce of common salt be dissolved in eight ounces of water, a brine will be formed, which will have the same specific gravity as yellow-amber; consequently, if a small quantity of that solid substance be pounded in a mortar, so as to be reduced to a coarse powder (of about the size of mustard seeds), this powder, on being put into the brine, will remain suspended in that liquid, and in all parts of it, without either sinking or rising to its surface; and the particles of the amber being visible in the brine, will, by their motions, indicate the motions and directions of the currents in the liquid, which take place when the temperature of the liquid is changed†.

If now, two like glass tumblers be filled, the one with the pure brine moderately heated, the other with an equal quantity of the same brine, at the same temperature, containing a small quantity of the powdered amber, intimately mixed with it, on exposing these two glass vessels with their contents, to cool in the air, in a quiet room, no motion will be perceived among the particles of the pure brine (which are invisible), but the motions which will be seen to take place among the particles of amber in the other tumbler, will afford a convincing proof that the apparent rest in the pure brine must necessarily be a deception; and that the particles of both these masses of cooling liquids are most undoubtedly in motion.

As soon as these liquids have acquired the temperature of the surrounding atmosphere, their internal motions will cease; but on every change of temperature they will recommence.

We may conceive the particles of amber disseminated in the brine, to represent the particles of the aromatic substance, disseminated in new-made Coffee; as long as the Coffee remains at rest, that is to say, as long as its temperature remains unchanged, these aromatic particles cannot escape; for they cannot come to the surface of the liquid; but when the liquid is put in motion, their escape is greatly facilitated.

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† In order that the brine may be rendered perfectly transparent, it should be filtered, or made to pass through filtering paper.

When the cause of any evil is perfectly known, it is seldom very difficult to find means to prevent it.

In order that Coffee may retain all those aromatic particles which give to that beverage its excellent qualities, nothing more is necessary, than to prevent all internal motions among the particles of that liquid, by preventing its being exposed to any change of temperature, either during the time employed in preparing it; or afterwards, till it is served up.

This may be done, by pouring boiling water on the Coffee in powder; and surrounding the machine in which the Coffee is made, by boiling water, or by the steam of boiling water; for the temperature of boiling water is invariable, (while the pressure of the atmosphere remains the same,) and the temperature of steam is the same as that of the boiling water from which it escapes.

But the temperature of boiling water is preferable to all others for making Coffee, not only on account of its constancy, but also, on account of its being most favourable to the extraction of all that is valuable in the roasted grain.

I found that Coffee, infused with boiling water, was always higher flavoured, and better tasted, than when the water used in that process was at a lower temperature.

I have made Coffee with cold water, and afterwards heated it; but this I have always found to be of a very inferior quality; it is very bitter, and not unfrequently of a sour disagreeable taste, especially when the cold water is a long time in passing through to Coffee in powder, and when they are suffered to remain together over night.

The fine aromatic substance is either not extracted by cold water, or it escapes afterwards while the coffee is heating.

Formerly, the ground Coffee being put into a coffee-pot, with a sufficient quantity of water, the coffee-pot was put over the fire, and after the water had been made to boil a certain time, the coffee-pot was removed from the fire, and the grounds having had time to settle, or having been fined down with isinglass, the clear liquor was poured off, and immediately served up in cups.

From the results of several experiments, which I made with great care, in order to ascertain what proportion of the aromatic and volatile particles in the Coffee escape, and are left in this process, I found reason to conclude, that it amounts to considerably more than half. This loss may easily be explained; it is occasioned, principally, no doubt, by the motions into which the liquid is thrown in being heated, and afterwards on being made to boil; but there are two other unfavourable circumstances attending this process that deserve attention.

The air that is attached to the small solid particles of the ground Coffee, often remain attached to them, and causing them to rise up to the surface of the water, and to remain there, these particles contribute very little to the strength or qualities of the liquor; and even those particles which, becoming thoroughly soaked with the water, are mixed with it; as they are surrounded, not by pure water, but by a solution of Coffee, more or less saturated, that circumstance is unfavourable to their solution.

Now, when Coffee is made in the most advantageous manner, the ground Coffee is pressed down in a cylindrical vessel, which has its bottom pierced with many small holes, so as to form a strainer, and a proper quantity of boiling hot-water being poured cautiously on this layer of Coffee in powder, the water penetrates it by degrees, and after a certain time begins to filter through it.

This gradual percolation brings continually a succession of fresh particles of pure water into contact with the ground Coffee and when the last portion of the water has passed through it, every thing capable of being dissolved by the water, will be found to be so completely washed out of it, that what remains will be of no kind of value.

This method of making Coffee, by percolation, has been practised many years, and its usefulness is now universally acknowledged. I do not know who was the first to propose it, but being thoroughly persuaded of the merit of the contrivance, I have been desirous of recommending it; and I conceived that the most effectual way of recommending it, would be to explain the mechanical and chemical principles on which its superiority depends.

In order that the Coffee may be perfectly good, the stratum of ground Coffee, on which the boiling water is poured, must be of a certain thickness, and it must be pressed together with a certain degree of force. If it be too thin, or not sufficiently pressed together, the water will pass through it too rapidly; and if the layer of ground Coffee be too thick, or if it be too much pressed together, the water will be too long in passing through it, and the taste of the Coffee will be injured.

Another circumstance, to which little attention has hitherto been paid, but which I have found to be of considerable importance, is the levelling of the surface of the ground Coffee, after it has been put into the strainer, before any attempt is made to press it together.

When the ground Coffee is poured into the strainer, it always stands much higher in one part of this vessel than elsewhere; and if, in that situation, it be pressed down on the perforated bottom of this vessel, without being previously levelled, it will be much more pressed in some parts than in others; and as the water will not fail to pass most rapidly, where it meets with the least resistance, a considerable portion of the ground Coffee will be so crowded together, as to prevent the water from passing through it, and consequently will contribute little or nothing to the strength of the beverage.

To remedy this inconvenience, I use the following simple contrivance. The circular plate of tin, with a rod fastened to its centre, which serves as a rammer for pressing down the ground Coffee, has four small projecting square bars, of about one-tenth of an inch in width, fastened to the under side of it, and extending from the circumference of the plate to within about one-quarter of an inch of its centre.

On turning this plate round its axis, by means of the rod which serves as a handle to it, (the rod being made to occupy the axis of the cylindrical vessel,) the projecting bars are made to level the ground Coffee; and after this has been done, and not before, the Coffee is pressed together.

This circular plate is pierced by a great number of small holes, which permit the water to pass through it, and it remains in the cylindrical vessel during the whole of the time that the Coffee is making. It reposes on the surface of the ground Coffee, and prevents its being thrown out of its place by the water which is poured on it.

The rod which serves as a handle to this circular plate is so short, that it does not prevent the cover of the cylindrical vessel from being put down into its place.

After having made a great number of experiments, in order to determine what thickness is best for the layer of ground Coffee, I have found that two-thirds of an inch answers best for the Coffee in powder, before it is pressed together, and that it ought to be so pressed, as to be reduced to the thickness of something less than *half-an-inch*.

As a *gill* is a measure well known I shall adopt it as a standard measure for a cup of Coffee; and as it is inconvenient to fill coffee-cups quite full to the brim, I shall propose coffee-cups to be made of the form and dimensions we now commonly have, or of a size proper for containing 8⅓ cubic inches of liquor, when filled quite full to the brim.

As a gill is equal to 7.1875 cubic inches, about seven-eighths only of the capacity of the cup will, in that case, be occupied by the Coffee. Now I have found, by the results of a great number of experiments, that *one quarter of an ounce* averdupois of ground Coffee, is quite sufficient to make a gill of most excellent Coffee, of the highest possible flavour, and quite strong enough to be agreeable.

And as the quantity of ground Coffee necessary for making a cup of good Coffee just fills a cylindrical measure, which is 1.15 inches in diameter and in height, its volume amounts to 1.1945 cubic inches; consequently, a cylindrical vessel, (which I shall call the strainer,) proper for making *one cup of Coffee*, must be of such diameter, that 1 1945 cubic inches of ground Coffee will fill it to the height of two-thirds of an inch.

On making the computation, it will be found, that one inch and a half is the most proper diameter for the strainer to be employed in making one single cup of good Coffee.

And in order that workmen may not have the trouble of computing the heights of the cylindrical vessels, which I have called strainers, which contain the water that is poured on the ground Coffee, I have given these heights in the following table. They have been determined on the supposition, that the diameter of the vessel is always just equal to the diameter of the perforated bottom by which it is closed below; and that the quantity of water necessary for making one cup of Coffee, is 8⅓ cubic inches.

A Table showing the diameters and heights of the cylindrical vessels (or strainers,) to be used in making the following quantities of Coffee.

Quantity of Coffee to be made at once.	Diameter of the strainer.	Height of the strainer.
1 cup,.........	1½ inches,.....	5¼ inches.
2 cups,........	2⅛	5¼
3 or 4 cups,...	2¾	5
5 or 6 cups,...	3½	5⅛
7 or 8 cups,...	4	5¼
9 or 10 cups,	4⅝	5⅓
11 or 12 cups,	5	5½

As there is so little difference in the heights of these strainers, and as a small additional height will be rather advantageous than otherwise, I would recommend them to be made all of the same height, viz. 5½ inches in height.

As these strainers must be suspended in their reservoirs, which are destined for receiving the Coffee, and at such a height, that after all the Coffee has passed through the strainer, the bottom of the strainer may still be above the surface of the Coffee in the reservoir; it will be best to make the reservoir of a conical form, and just large enough above to receive the strainer in such a manner that it may be suspended in the reservoir by means of a narrow projecting brim.

The boiler in which the reservoir is suspended, may likewise be made conical, and of such diameter above, as to receive the reservoir in such a manner as to be firmly united to it.

The reservoir and its boiler must be soldered together above, at their brims.

The small quantity of water which it will be necessary to put into the boiler, in order that the reservoir for the Coffee may be surrounded by steam, may be introduced by means of a small opening on one side of the boiler, situated above, and near the upper part of its handle.

The spout through which the Coffee is poured out, passes through the side of the boiler, and is fixed to it by soldering. The cover of the boiler serves at the same time as a cover for the reservoir, and for the cylindrical strainer, and it is made double, in order more effectually to confine the heat.

The boiler is fixed below to a hoop, made of sheet-brass, which is pierced with many holes. This hoop, which is one inch in width, and which is firmly fixed to the boiler, serves as a foot to it, when it is set down on a table, and it supports it in such a manner, that the bottom of the boiler is elevated to the height of half an inch above the table.

When the boiler is heated over a spirit-lamp, or over a small portable furnace in which charcoal is burnt, as the vapour from the fire will pass off through the holes made in the sides of the hoop, the bottom of the hoop will always remain quite clean, and the table-cloth will not be in danger of being soiled, when this coffee-pot is set down on the table.

As the hoop is in contact with the boiler, in which there will always be some water, it will be so cooled by this water, as never to become hot enough to burn the table-cloth.

The bottom of the boiler may be cleaned occasionally on the underside, with a brush or a towel, but it should not be made bright, for when it is bright, it will be more difficult to heat the water in it, than when it is tarnished and of a dark brown colour.

But the sides of the boiler should be kept as bright as possible, for when its external surface is kept clean and bright, the boiler will be less cooled by the surrounding cold bodies, than when its metallic splendour is impaired by neglecting to clean it.*

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* I have in my possession two porcelain tea-pots of the same form and dimensions, one of which is gilt all over on the outside, and might easily be mistaken for a gold tea-pot; the other is of its natural white colour, both within and without; being neither painted nor gilt. When they are both filled at the same time with boiling water, and exposed to cool in the same room, that which is gilt retains its heat half as long again as that which is not gilt. The times employed in cooling them, a given number of degrees, are as three to two.

The result of this interesting experiment (which I first made about seven years ago,) affords a good and substantial reason for the preference which English ladies have always given to silver tea-pots. The details of this experiment may be seen in a paper published in the Memoirs of the French National Institute for the year 1807.

I have likewise a set of tea-cups, and another of coffee-cups, which are gilt on the outside, and they preserve the heat of

The small quantity of water which is put into the boiler serves merely for generating the steam which is necessary in order to keep the reservoir and its contents constantly boiling-hot.

In order that the flat bottom of the boiler may not smother and put out the fire, the brim of the small furnace or chaffing-dish, which is used, must have six projecting knobs; at the upper part of it, each about one-quarter of an inch in height, on which the bottom of the boiler may rest.

If these knobs (which may be the large heads of six nails), be placed at equal distances from each other, the boiler will be well supported; and as the hot vapour from the fire will pass off freely between them, the fire will burn well. As a very small fire is all that can be wanted, no inconvenience whatever will arise from the heating of the boiler on the table, in a dining-room or breakfast-room, especially if a spirit lamp be used, and the quantity of heat wanted is so very small, when the water is put boiling hot into the boiler, that the expense for spirits of wine, would not, in London, amount to one penny a day, when Coffee is made twice a day for four persons.

It is a curious fact, but it is nevertheless most certain, that in some cases, spirits of wine is cheaper, when employed as fuel, even than wood. With a spirit lamp, constructed on Argand's principle, but with a chimney made of thin sheet iron, which I caused to be made about seven years ago (and which has since become very common in Paris†), I heated a sufficient quantity of cold water, to make Coffee for the breakfast of two persons, and kept the Coffee boiling hot, one hour after it was made; with as much spirits of wine as cost two *sous*, or one penny English money.

As Coffee is very wholesome, and may be afforded at a very low price, many public advantages would be derived from the general introduction of it among all classes of society.

One most important advantage, which, on a superficial view of the subject, is not very obvious, would most probably be derived from it. As Coffee possesses, in a high degree, an exhilarating quality, it would, in some measure, supply the place of spirituous liquors among the lower classes of the people.

Those who work hard, stand in need of something to cheer and comfort them, from time to time; and it is greatly to be lamented that the strong liquors now used for that purpose, are not only very unwholesome and permanently debilitating, both to the mind and the body, but that their operation is accompanied by a peculiar species of madness, which renders those who are under the influence of it very mischievous, and so lost to all sense of decency and propriety, as to become objects of horror and aversion.

The pleasing flow of spirits that is excited by Coffee, has none of these baneful effects.

Instead of irritating the mind, and exciting to acts of violence, it calms every turbulent and malevolent passion, and is accompanied by a consciousness of ease contentment, and good-will to all men, which is very different from that wild joy and unbridled licentiousness which accompanies intoxication.

Coffee is not only very wholesome, but when sweetened with sugar, is very nourishing.

Half a pint of the best Coffee, or two full cups, may be made with half an ounce of ground Coffee, which, if one pound averdupois weight of raw Coffee can be bought in the shops for twelve-pence sterling, will cost only six-sevenths of a farthing; and if a pound of brown sugar can be bought for one shilling, one ounce of sugar, which would be a large allowance for two cups of Coffee, would cost only three farthings; consequently the materials for making half a pint of Coffee would cost less than one penny.

But I must hasten to put an end to this Essay, which has already exceeded the limits to which I had hopes of being able to confine it. Being anxious that it might be

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those liquids, much longer than China-cups which are not so gilt.

Little advantage would be derived from gilding them on the inside, and none at all if they were filled quite full with the hot liquid.

I have found, that all metals are alike useful in preserving heat (or cold), provided their surfaces be quite clean and bright.

† I intend, if possible, to send one of these spirit lamps to England, with this Essay, in order that it may be put into the hands of some workman there, who may be disposed to imitate it.

read by many persons, (as I thought that it would be very useful,) I felt the necessity of making it as short as possible, I shall conclude with a few observations on the means that may be employed for rendering the use of Coffee more general among the lower classes of society.

In the first place, the method of making good Coffee must be known; and the utensils necessary in that process must be so contrived, as to be cheap and durable, and easy to be managed.

For very poor persons, who cannot afford to buy a Coffee-pot, I shall recommend a very simple contrivance, by means of which Coffee may be made, and even in the highest possible perfection.

The whole of this apparatus consists of a coffee-cup, which should hold about three quarters of a pint; and a strainer made of tin, which is suspended in it by its brim.

This coffee-cup should be cylindrical, and when employed in making one gill of good strong Coffee, should be three inches in diameter within, and three inches and a half deep. The lower part of the strainer is one inch and a half in diameter, and one inch deep; and the upper part of it two inches and nine-tenths in diameter, and about one inch and a half in depth.

The water which is poured on the ground Coffee should be boiling hot; the cup and the strainer having both been previously heated, by dipping them into boiling water.

As the Coffee will not be more than eight or ten minutes in passing through the strainer, it is probable that it will be quite as hot as it can be drank, after it has descended into the lower part of the cup; but if it should be necessary to keep it hot a longer time, the cup may be placed in a small quantity of boiling water, contained in a small saucepan, or other fit vessel, placed near the fire.

When all the Coffee has passed into the lower part of the cup the strainer may be taken away, and the cup may be covered with the cover of the strainer.

As many persons may prefer coffee-pots made entirely of Staffordshire-ware, porcelain, or other pottery, to those made of the metals, not only on account of the low prices at which they may be afforded, but also on account of their superior neatness and cleanliness.

It is necessary to state that when this coffee-pot is used, it should be placed in boiling water to keep it hot, and it will be useful to cover the whole with a cylindrical vessel turned upside down; by which means both the strainer and the coffee-pot will be surrounded by hot steam, which will contribute very essentially to the goodness of the Coffee.

As soon as the Coffee has passed into the coffee-pot the strainer may be taken away, and the coffee-pot covered with the cover which is common to it, and to the strainer.

I shall conclude by a few observations, on the means that may be used for preserving ready made Coffee, good for a considerable time in bottles.

The bottles having been made very clean, must be put into clean cold water, in a large kettle, and the water must be heated gradually, and made to boil, in order that the bottles may be heated boiling hot.

The Coffee, fresh prepared and still boiling hot, must be put into these heated bottles, which must be immediately well closed with good sound corks.

The bottles must then be removed into a cool cellar, where they must be kept well covered up in dry sand, in order to preserve them from the light.

By this means ready-made Coffee may be preserved good for a long time, but great care must be taken not to let it be exposed to the light, otherwise it will soon be spoiled.

When wanted for use the Coffee must be heated in the bottle and before the cork is drawn; otherwise a great deal of the aromatic flavour of the Coffee will be lost in heating it. And in order that it may be heated in the bottle without danger, the bottle must be put into cold water, and this water must be gradually heated till the Coffee has acquired the degree of heat which is wanted. The cork may then be drawn, and the Coffee poured out, and served up.

As good Coffee is very far from being disagreeable when taken cold, and as there is no doubt but it must be quite as exhilarating when cold as when it is taken hot, why should it not be made to supply the place of those pernicious drams of spirituous liquors which do so much harm?

Half a pint of good cold Coffee, properly sweetened, which would not cost more than half a pint of porter, would be a much more refreshing and exhilarating draft; and would no doubt be incomparably more nourishing.

How much then must it be preferable to a dram of gin!

METHOD OF TAKING IRON-MOULDS OUT OF COTTON.

(From the Annals of Philosophy, June, 1813.*)*

Every body knows that cottons of all kinds are apt to receive a dirty yellowish, or orange stain, from iron, which if allowed to remain, gradually corrodes the cloth and forms a hole. At first these stains are easily removed by means of muriatic acid, or any other diluted acid (except vinegar); but, after they have remained for some time, acids have no effect upon them. It may be acceptable to to point out the method of removing these moulds in such inveterate cases.

The iron in them is in the state of red oxide; and it appears, from various facts well known to chemists, that the red oxide of iron has a much greater affinity for cotton cloth than the black oxide. The object in view, therefore, should be to bring the iron in the mould to the state of black oxide; after which, muriatic acid will easily remove it. Now there are two methods of doing this; both of which in the present case answer the purpose completely. The first is to touch the mould with the yellow liquid formed by boiling a mixture of potash and sulphur in water, called hydrogureted sulphuret of potash by chemists. The mould becomes immediately black, and the action of diluted muriatic acid immediately effaces it. The second method is to daub the mould over with ink so as to make it quite black. After this muriatic acid takes it out, as in the former case. I conceive that this is occasioned by the action of the nutgalls in the ink, which reduces the iron in the mould to the state of black oxide.

STEAM BOAT.

It is long since vessels impelled by steam have been applied to all sorts of useful purposes upon the great rivers in America, but it is only within these few months that the same power was applied with success to that purpose in Great-Britain. Very lately, Mr. Henry Bell, for the Helensburgh baths, on the Clyde, constructed a boat, having a small steam engine adapted to it; and so effectually succeeded in conveying passengers to Greenock and Helensburgh to their perfect satisfaction, that no less than four coaches plying between Glasgow and Greenock have been recently discontinued. The distance from Glasgow and Greenock by water is 26 miles, which is performed, in ordinary cases, in four hours, sometimes under three and a half, whatever the state of the wind or tide may be.

LIST OF NEW PUBLICATIONS.

AGRICULTURE.

A TREATISE on the culture of Wheat, recommending a system of management, founded on the successful experience of the author; by a Practical Farmer, 7s. 6d.

BIOGRAPHY.

Memoirs of the Private and Public Life of William Penn; by Thomas Clarkson, M.A., 2 vols.

The Metrical Life of Thomas Churchyard, Esq.; extracted from two of his productions of extreme rarity, one of which is preserved in the Bodleian Library, and the other in the Ashmolean Museum, Oxford, 15s.

DRAMA.

At Home; a farce, in two acts, 2s.

Count Julian; a tragedy, 5s. 6d. bds.

EDUCATION.

Grammatical Dialogues for Children; by Miss Lloyd, 1s. 6d.

Report of the Finance Committee of the Royal Lancasterian Institution for the Education of the Poor, for 1812, 1s.

GEOGRAPHY.

A Statistical Chart of Europe; uniting all that is most interesting in the Geography of that portion of the globe; and showing at one view, the territorial extent, the military strength, and the commercial importance of each State; containing the